



Reimbursing Contractors for Changes
in the Work

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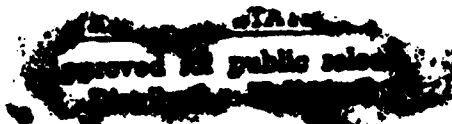
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Introduction

Changes are a normal occurrence on just about every construction project. These changes occur due to changed conditions, inadequate contract drawings or specifications, and additional work not anticipated in the original contract. Most often these changes require the contractor to perform work which was not in the original bid package. When these changes cause the contractor to perform additional work not in the contract, the contractor is due compensation for the added costs. The method of compensation can take various forms.

When changes are identified and it is decided that additional work is required, the owner requests a cost proposal from the contractor. This request is often called a "request for proposal". Depending on the owner's policy, the contractor's proposal may take different forms. Some owners require the contractor to provide a detailed breakdown of the costs for the proposed work. Others merely request that the contractor provide the lump sum costs for any additional work. If the original contract is a unit price contract and the changes in unit quantities do not change the cost of any major item of work by more than an established amount, generally 25 percent, the cost of the work is based upon the unit prices provided by the contractor's bid. When changes in unit price contracts change the cost of a major item by more than 25 percent, the contractor or owner may request a renegotiation of the cost of the changes. During this renegotiation, the overhead and profit associated with the change, along with the direct costs, are subject to modification. Even when the contractor provides a detailed breakdown or a lump sum price, the final cost of the change is open to negotiation. It is when these negotiations break down and the parties cannot reach a mutually agreeable price, that the owner has the option of directing the contractor to perform the work on a cost plus basis.

The term "cost plus" can be used in a variety of ways, but when applied to changed work, cost plus contracting and force account work are the same. The contracting process described is illustrated in Figure (1). Cost plus consists of the contractor performing the additional work with reimbursement being based on documentation of all allowable direct costs associated with the work. The owner reviews the costs to determine allowability of the charges and the contractor is then reimbursed for the direct costs of the change, plus additional mark-ups applied to the direct costs to cover overhead and profit. Because the contractor is reimbursed for all direct expenses and given a mark-up for overhead and profit, the risk to the contractor to perform this work is greatly reduced. Cost plus contracting does not provide the contractor any incentive to control costs, and the owner is obligated to pay for any and all allowable expenses. Cost plus contracting is not the preferred method of owners for accomplishing most extra work because of the presumed economic disadvantages.

An aspect that makes cost plus change orders unattractive to contractors is the amount of paperwork required to substantiate the additional costs of the work. This includes payroll records, material invoices, equipment rental receipts, and any other documentation needed to support costs. The supporting documentation usually needs to be submitted to the owner by the following working day, or within a stringent time period. This requires a great deal of additional work on the part of the job supervisor. Some owners even penalize contractors if the documentation is not submitted within the stipulated time frame. Since cost plus contracting poses disadvantages to both owners and contractors, it is used infrequently. This paper will examine how the allowable direct costs for cost plus work and the percentage mark-ups on the direct charges vary from owner to owner.

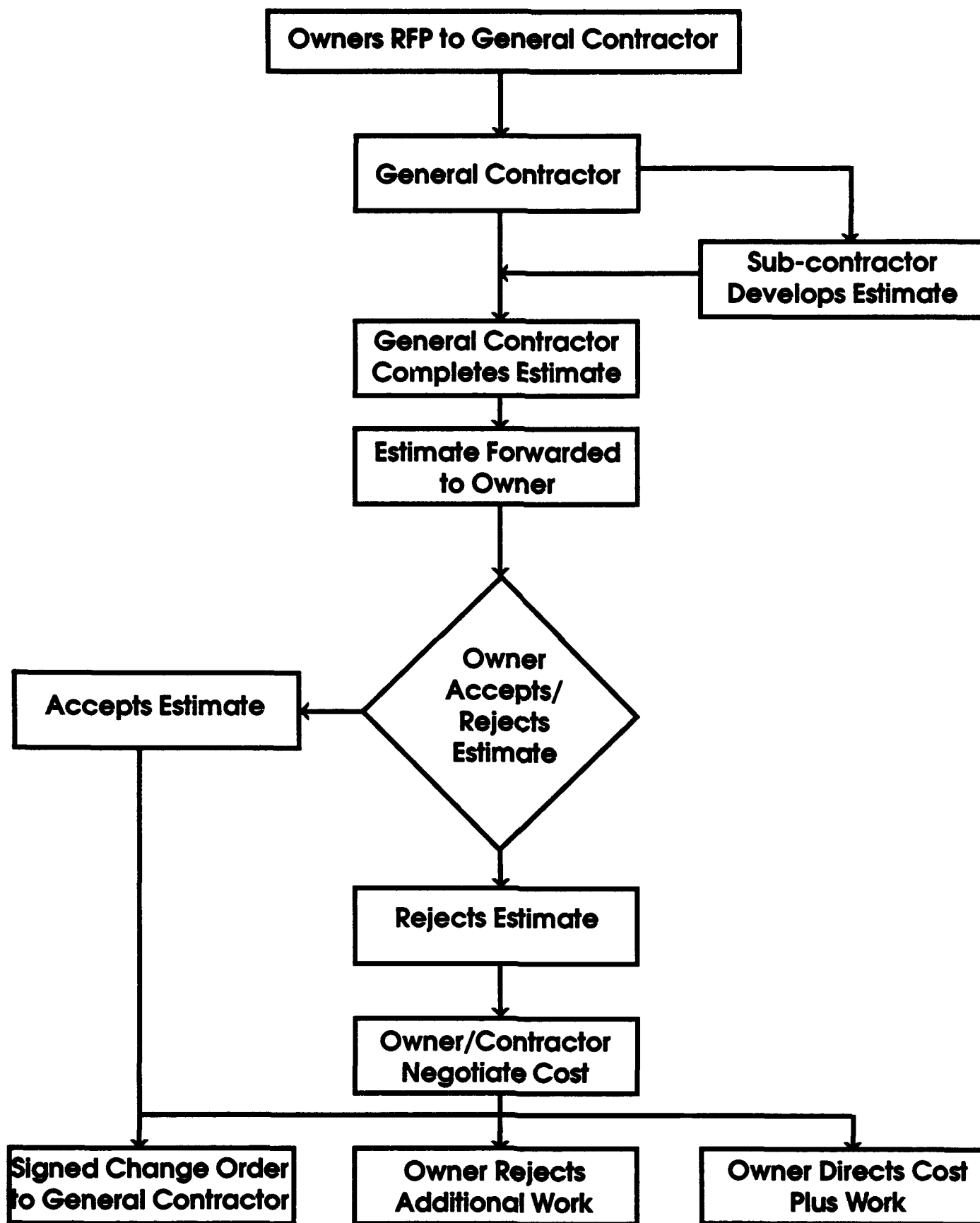


Figure 1

Research Methodology

This research involved reviewing general conditions of contracts and interviewing local professionals working in the construction industry.

The general conditions of the standard specifications of the fifty State Highway Authorities (SHA) were reviewed. Another twenty-four specifications from utility companies, universities, and the City of Detroit were included in the study. The provisions quoted in this report were chosen to show the differences in cost plus contracting among a wide range of contracting agencies. The State Highway Authority documentation reviewed were selected from states with larger highway systems. It was assumed that these documents reflected more contracting experience. The utility companies, city, and university provisions reviewed provided a nationwide sample of smaller contracting agencies with different contracting regulations. The Federal Acquisition Regulations, the contracting regulations for Federal agencies, were also reviewed to provide input from an owner that contracts on a nationwide level. All the documents reviewed, with the exception of the Oklahoma Department of Transportation, contained provisions related to cost plus contracting. The cost plus provisions studied in this report typically applied a percentage mark-up to the direct costs of the changes for overhead and profit. This determination of reimbursement for overhead and profit is referred to by the federal regulations as cost-plus-a-percentage-of-cost contracting. Federal agencies are not authorized to enter into cost-plus-a-percentage-of-cost contracts or to use this method of compensation when determining the costs for changes. The following is a listing of the agencies, other than the SHAs, whose specifications were reviewed for this research:

Utility Companies

Alabama Power Company
Allegheny Power System (PA)
ARCO Products Corporation
Arkansas Power & Light
Benton County (WA)
Cincinnati Gas & Electric Company
Consumers Power Company (MI)
Georgia Power Company
Idaho Power Company
Iowa-Illinois Gas & Electric
Kansas City Power & Light

Long Island Lighting Company
Metropolitan Edison Corporation
New York State Electric & Gas
Ohio Edison
Public Services of New Hampshire
Public Utilities Board (TX)
Southern California Edison Corporation
Snohomish County (WA)
Upper Peninsula Power Company
Wisconsin Power & Light

Others:

City of Detroit
Texas Tech University
University of Washington

Included as part of the report are the results of interviews conducted with 5 claims consultants, 2 lawyers and 1 certified public account from the Seattle area. A list of those interviewed is included in Appendix A. Interviewees were contacted prior to the interviews and provided a questionnaire which was used during the interview. A copy of the questionnaire is included in Appendix B. Questions centered around problems that arise from using contractually established percentage mark-ups to determine the reimbursement of overhead and profit on changes. Also, personal experiences with controversial direct costs were often addressed. The average interview lasted one hour and followed the format of the questionnaire. The problems or issues which received the most attention from the interviewees are included in the report. Other problems were discussed but these tended to be either job or owner specific. Everyone interviewed was very helpful and contributed greatly to this study.

Research Results

Contract specifications and general conditions from federal, state and private agencies were reviewed for this paper. The majority of the agency contracts were from SHAs, utility agencies, and city public works departments.

The provisions being quoted are those found to be typical of the Departments of Transportation (DOT) or they are presented to highlight unique aspects that are used in some provisions. The changes provisions generally applied a percentage mark-up to the associated direct labor, material and equipment costs.

How the different agencies apply the percentage mark-up and what they permit as allowable costs provides the material for this report. For example, the Washington State DOT provisions went further than the majority by specifically addressing costs for travel and mobilization/demobilization. Mobilization/demobilization and travel costs were generally not addressed by the owners when specifying allowable direct costs. The Texas State Department of Highways and Public Transportation change provisions were included to show a major difference in the method used to compensate for overhead and profit among SHAs. The Texas provisions do not apply the mark-up to the direct costs of equipment, a major cost in the heavy construction industry. The provisions of other owners had a significant difference in either the allowable costs or the mark-up applied for overhead and profit.

All contracts reviewed provided several methods of determining the costs of "changes." The Washington State Department of Transportation (WSDOT) specifications provide a concise listing of the type of changes discussed in this paper. According to WSDOT documents, the term "changes", includes:

1. Deleting any part of the work,
2. Increasing or decreasing quantities,
3. Altering specifications, designs, or both,
4. Revising the way the work is to be done,
5. Adding new work,
6. Altering State-provided facilities, equipment, materials, services, or sites,
or
7. Ordering the Contractor to speed up or delay the work.

For unit price contracts, the method most favored by owners to determine compensation for changes is to use the unit prices already included in the contract as a basis of payment. The unit prices provided in the contract include the direct and indirect costs of the work along with an allowance for profit. Using the unit prices reduces the negotiation process to agreeing on the quantities or volumes involved.

Another method of establishing compensation amounts for changes is to negotiate an equitable adjustment for the costs of the change. When changes are discovered or additional work is determined to be required, the owner requests a proposal from the contractor for the additional costs. At the same time the owner performs a cost estimate of the proposed work. The owner may accept the prices quoted by the contractor or the parties then negotiate a final price based on the cost estimates developed. This allows both parties to agree upon the direct and indirect costs, and the profit associated with the change. When both parties cannot agree on a cost, the owner has the option of ordering the work performed on a force account or cost reimbursable basis. Force account, cost plus or cost reimbursable contracting is the basis for this research paper. In cost plus contracting the contractor is reimbursed for the allowable direct costs associated with the change along with contractually established mark-ups for overhead and profit.

The following contract clauses are taken from the Illinois Department of Transportation, Standard Specifications for Road and Bridge Construction. The Illinois DOT specifications were quoted to show how cost plus or force account work can be directed

by the owner and to provide a basis of comparison with other agency provisions. The contract provisions which are quoted in this study all have some differences which can affect the way a contractor approaches the job. The Illinois DOT provisions are representative of the general format contained in the contracts reviewed. Note that the actual percentages applied for overhead and profit vary from State to State. The provisions used by WSDOT and the Texas DOT are also presented in order to show how the force account provisions may vary among similar owners. The following provisions are used by the Illinois DOT. Underlining is provided to emphasize key points of the provisions quoted.

104.03 **Alterations, Cancellations, Extensions and Deductions.** The Department reserves the right to alter the plans, extend or shorten the improvement, add such work as may be necessary, and increase or decrease the quantities of work to be performed to accomplish such changes, including the deduction or cancellation of any one or more of the unit price items, or cancellation of the contract.

Should such changes in the plans result in an increase or decrease in the quantities of the work to be performed, the Contractor shall accept payment as follows:

- (a) All increases in such work of the type that appears in the contract as pay items accompanied by unit prices shall, except as provided under paragraph (c) herein, be paid for at the contract unit prices. Decreases in quantities included in the contract shall be deducted from the contract at the unit bid prices. No allowance will be made for delays or anticipated profits.
- (b) Extra work which is not included in the contract as pay items at unit prices and is not included in other items of the contract shall be paid for as specified in Article 109.04. (*quoted later in this section*)
- (c) Extra work for which there is a pay item at unit price in the contract that for any one or more of the following reasons materially increases or decreases the cost of the pay item as bid and which is not included in the prices bid for other items in the contract shall be paid for as provided in Article 109.04.
 - (1) Work involving a substantial change of location
 - (2) Work which differs in design
 - (3) Work requiring a change in the type of construction

- (d) In cases where the Department cancels or alters any portion of the contract, items which are partially completed shall be paid for as provided under Article 109.06.

All alterations, cancellations, extensions and deductions shall be authorized in writing by the Engineer before work is started. Such authorizations shall set up the items of work involved and the method of payment for each item.

Claims for extra work which have not been authorized in writing by the Engineer will be rejected.

109.04 Payment for Extra Work.

Extra work which results from any of the changes as specified in Article 104.03 shall not be started until authorization from the Engineer is received, which authorization shall state the items of work to be performed without such order will not be paid for.

Extra work will be paid for:

- (a) Either at a lump sum price or at unit prices agreed upon by the Contractor and the Engineer.

- (b) On the following force account basis:

- (1) Labor. For all labor and foremen in direct charge of the specific operations, the Contractor will receive the actual normal rate of wage paid for each and every hour that said labor and foremen are actually engaged in such work.

The Contractor will receive the actual costs paid to, or in behalf of, workmen by reason of subsistence and travel allowances, health and welfare benefits, pension fund benefits or other benefits, when such amounts are required by collective bargaining agreement or other employment contract generally applicable to the classes of labor employed on the work.

An amount equal to 35 percent of the sum of the above items will also be paid the Contractor.

- (2) Bond, Insurance and Tax. For property damage, liability and workmen's compensation insurance premiums, unemployment insurance contributions and social security taxes on the force account work, the Contractor will receive the actual cost, to which

10 percent will be added. The Contractor shall furnish satisfactory evidence of the rate or rates paid for such bond, insurance and tax.

(3) Materials. For materials accepted by the Engineer and used, the Contractor will receive the actual cost of such materials delivered on the work, including transportation charges paid by the Contractor (exclusive of machinery rentals as hereinafter set forth), to which cost 15 percent will be added.

(4) Equipment. For any machinery or special equipment (other than small tools) the use of which has been authorized by the Engineer, the Contractor will be paid in accordance with the latest revision of "SCHEDULE OF AVERAGE ANNUAL EQUIPMENT OWNERSHIP EXPENSE" as issued by the Department. The equipment should be of a type and size reasonably required to complete the extra work.

(5) Miscellaneous. No additional allowance will be made for general superintendence, the use of small tools, or other costs for which no specific allowance is herein provided.

(6) Statements. No payment will be made for work performed on a force account basis until the Contractor has furnished the Engineer with itemized statements of the cost of such force account work detailed as follows:

a. Name, classification, date, daily hours, total hours, rate and extension for each laborer and foremen. Payrolls shall be submitted to substantiate actual wages paid if so requested by the Engineer.

b. Designation, dates, daily hours, total hours, rental rate and extension for each unit of machinery and equipment.

c. Quantities of materials, prices and extensions.

d. Transportation of materials.

e. Cost of property damage, liability and workmen's compensation insurance premiums, unemployment insurance contributions and social security tax.

(7) When work is performed by an approved Subcontractor, the Contractor shall receive as administration costs an amount equal to five (5) percent of the first \$10,000 and one (1) percent of any amount over \$10,000 of the total approved costs of such work.

Statements shall be accompanied and supported by receipted invoices for all materials used and transportation charges. However, if materials used on the force account work are not specifically purchased for such work but are taken from the Contractor's stock, then in lieu of the invoices, the Contractor shall furnish an affidavit certifying that such materials were taken from his/her stock, that the quantity claimed was actually used, and that the price and transportation claimed represent the actual cost to the Contractor.

The Illinois DOT provisions provide for three methods for compensating the contractor for changes: adjusting the quantities on a unit price basis, negotiating an equitable agreement or directing the work on a cost reimbursable basis. It is when the first two methods fail that the third option, force account or cost plus is exercised. If the parties cannot come to an agreement on the cost as established by the first two means, and the work needs to be performed, the owner has the option to direct the contractor to proceed with the work on a force account basis.

The Illinois DOT specifications are representative of the contract specifications reviewed in regards to the items that are allowed and the direct costs that receive a mark-up for overhead and profit. The contracts reviewed varied in allowable direct costs and differed greatly in the percentages applied towards those costs for overhead and profit. The allowable costs for force account work in the Illinois DOT specifications are outlined below:

Labor

The contractor is reimbursed for all direct labor and supervision of force account items up to the foreman level. All subsistence and travel allowances, health and welfare benefits and pension benefits are also paid for by the owner. Job superintendent costs are not allowable as a direct cost.

A mark-up of 35 percent is applied for overhead and profit.

Material

The owner will pay for the actual cost of materials, including transportation costs. The contractor needs to provide invoices to support the material charges or a signed statement if material is taken from contractors stock.

A mark-up of 15 percent is applied for overhead and profit.

Equipment

The contractor will be reimbursed for equipment authorized by the Engineer at the rate established by the "Schedule of Average Annual Equipment Ownership Expense", a document provided by the department. The specifications do not differentiate between rented or owned equipment.

No mark-up is applied to the cost of equipment.

Subcontractor

The contractor receives 5 percent mark-up for the first \$10,000 of subcontractor costs and 1 percent of any cost above \$10,000 for administrative cost.

Washington State Department of Transportation (WSDOT)

The WSDOT specifications differ from the Illinois DOT in that they provide much greater guidance on the allowable costs and unlike the Illinois specifications, include a mark-up on the direct equipment costs. The applicable sections are as follows:

1-09.6 Force Account

If the contract calls for work or materials to be paid for by force account, payment amounts will be determined as shown below.

1. Labor

The State will reimburse the Contractor for labor and for supervision by foremen dedicated solely to the particular force account item of work (but not for supervision by general superintendents or general foremen). The Engineer will compute the labor payment on the basis of these four factors:

a. Weighted Wage Rate.

The Weighted Wage Rate combines: (1) the current basic wage and fringe benefits the Contractor is required and has agreed to pay, (2) Federal Insurance Compensation (FICA), (3) Federal Unemployment Tax Act (FUTA), and (4) State Unemployment Compensation Act (SUCA).

A Weighted Wage Rate shall be computed for each classification of labor used. This rate shall reflect the Contractor's actual cost. It shall neither exceed what is normally paid to comparable labor nor fall below the minimum required by Section 1-07.9. If the Engineer authorizes overtime, the Weighted Wage Rate shall be determined on the same basis.

b. Travel Allowance and Subsistence.

This includes the actual costs of allowances for travel or subsistence paid to employees in the course of their work on the item. This reimbursement will be made only if such allowances are required by a regional labor agreement or are normally paid by the Contractor to comparable labor for performing other work.

c. Industrial Insurance and Medical Aid Premiums.

The Contracting Agency will reimburse Contractor-paid premiums for Marine Industrial Insurance, for State of Washington Industrial Insurance, and Medical Aid Premiums which become an obligation of the Contractor and are chargeable to the force account work. The Contracting Agency will not pay the Contractor for Medical Aid premiums that are paid by the employees.

d. Overhead and Profit.

The State will pay the Contractor 20 percent of the sum of the costs listed in a, b, and c above to cover project overhead, general company overhead, profit, and any other costs incurred.

2. **Materials**

The state will reimburse actual invoice cost for Contractor-supplied materials. This cost includes actual freight and express charges and taxes as described in Section 1-07.2 provided that these costs have not been paid in some other manner under the contract. A deduction will be made for any offered or available discounts or rebates if the State has provided the Contractor with the means to comply with the provisions allowing the discount. The State will then add 15 percent of the balance to cover project overhead, general company overhead, profit, and any other cost of supplying materials.

To support charges for materials, the Contractor shall provide the Engineer with valid copies of vendor invoices, including freight and express bills. If invoices are not available for materials from the Contractor stocks, the Contractor shall certify actual costs by affidavit.

If claims for materials costs are too high, inappropriate, or unsupported by satisfactory evidence, the Engineer may determine the cost for all or part of the materials. When determined in this manner, the cost will be the lowest current wholesale price from a source that can supply the required quantity (including delivery costs).

The State reserves the right to provide materials. In this case, the Contractor will receive no payment for any costs, overhead, or profit.

3. **Equipment**

The approval of the Engineer shall be required for the selection of machine-power tools or equipment prior to their use on force account.

The payment for any machine-power tools or equipment shall be made according to the current AGC/WSDOT Equipment Rental Agreement which is in effect at the time the force account is authorized. The rates as set forth in the Rental Rate Blue Book (as modified by the current AGC/WSDOT Equipment Rental Agreement) are the maximum rates allowable for equipment of modern design and in good working condition. These rates shall be full compensation for all fuel, oil, lubrication, repairs, maintenance, and all other costs incidental to furnishing and operation the equipment except labor for operation.

The State will add 15 percent to equipment costs to cover project overhead, general company overhead, and profit.

Current copies of the Rental Rate Blue book and AGC/WSDOT Equipment Rental Agreement will be maintained at each District office of the Department of Transportation and at each of the offices of the Associated General Contractors of America (in Seattle, Spokane, Tacoma, and Wilsonville, Oregon) where they are available for inspection.

4. **Force Account Mobilization**

Force account mobilization is defined as the preparatory work performed by the Contractor including transportation of tools, equipment, and personal travel time (when included in a bargaining agreement). The State may pay for mobilization of equipment and labor if the force account item is not an item included in the original contract proposal or such other contract items as may be included in the special provisions as being eligible for reimbursement for mobilization. Off-site work in preparation for the travel to the project, costing \$300 or less will not be paid. The State will not pay for mobilization for off-site preparatory work for force account items under any circumstances unless the Contractor specifically makes a request in writing in advance of any such mobilization work. The written request shall include an estimate for mobilization cost involving off-site preparatory work and basis for reimbursement. The approval of the Engineer will be required prior to commencing the mobilization for all force account. To the agreed final amount of mobilization for force account shall be added an amount equal to 15 percent of that sum for all other costs, including project overhead, general company overhead, and profit.

5. **Subcontractors**

The subcontractors will be allowed a 5 percent markup of the total cost computed from 1, 2, 3, and 4 for insurance, B&O tax, and bonding.

6. **Contractor Markup on Subcontractors**

When work is performed on a force account basis by approved subcontractors, the Contractor will be allowed an additional markup equal to 5 percent of the total cost computed for 1, 2, 3, 4 and 5 for all administrative costs.

7. **Insurance, B&O Tax, and Bonding**

The Contractor will be allowed an additional markup equal to 5 percent of the total cost computed for 1, 2, 3, 4, 5, and 6 for insurance, B&O tax, and bonding.

The payments provided above shall be full payment for all work done on a force account basis. The payment shall cover all expenses of every nature, kind, and description, including overhead expenses, profit, occupational tax and any other Federal or State revenue acts, premiums on public liability and property damage insurance policies, and for the use of small tools and equipment for which no rental is allowed.

No claim for force account shall be allowed except upon written order by the Engineer prior to the performance of the work. No work shall be construed as force account work which can be measured under the specifications and paid for at the unit prices named in the contract.

The amount and costs of any work to be paid by force account shall be computed by the Engineer, and the amount certified by the Engineer shall be final as provided in Section 1-05.1.

The Contractor's wage, payroll, and cost records pertaining to work paid for on a force account basis shall be open to inspection or audit as provided in Section 1-09.12. *(for a period of not less than three years after the acceptance date)*

The Washington Department of Transportation provides compensation to the contractor for labor, materials, equipment, and mobilization. The provision states specifically how the contractor is reimbursed.

Labor

The contractor is reimbursed for all direct labor and supervision of force account items up to the foreman level. The contractors job superintendent cost are not allowable as a direct cost. WSDOT uses a weighted wage rate that includes the basic wage and any fringe benefits the contractor is obligated to pay. WSDOT treats overtime costs the same as they treat normal working hour costs. Travel allowance, subsistence, industrial insurance, and 50 percent of medical aid premiums are recoverable from the owner.

A mark-up of 20 percent is applied to the labor costs to cover "project overhead, general company overhead, profit, and any other costs incurred."

Materials

The contractor is reimbursed for the actual invoiced costs of all materials used on the force account item of work. To obtain compensation the contractor has to supply copies of all vendor invoices, including freight and express bills. For materials taken from the contractors stock, a signed affidavit needs to be provided showing the contractors costs. The WSDOT provisions grant the state the right to take any deductions that the contractor has available or is offered, if the state did not interfere with the contractors ability to meet the rebate requirements. The state retains the right to determine the fair market price for any and all material used on the force account work. If the costs are determined to be excessive by the Engineer, the owner has the authority to establish the price the state will pay for the material.

A mark-up of 15 percent is applied to the material costs to cover "project overhead, general company overhead, profit, and any other cost of supplying materials."

Equipment

The contractor is reimbursed for the cost of equipment based upon the Associated General Contractors/Washington State Department of Transportation (AGC/WSDOT) Equipment Rental Agreements. The agreements are a modification of the current Rental Rates Blue Book. The Engineer must approve the use of any equipment to be used on the force account work.

A mark-up of 15 percent is applied to the equipment costs to cover "project overhead, general company overhead, and profit."

Mobilization

The contractor is reimbursed for mobilization costs that were not a part of the original contract. If the contractor has any off-site preparatory costs for the force account work, a written request must be provided to the owner prior to incurring any such costs. The owner does not pay for off-site preparatory work that costs the contractor less than \$300. A mark-up of 15 percent is applied to the mobilization costs to cover "project overhead, general company overhead, and profit."

Subcontractors

Subcontractors are allowed a 5 percent mark-up to cover "insurance, B&O tax, and bonding."

Additional Mark-ups

The contractor is allowed a 5 percent mark-up on the subcontractor's costs for administrative costs and another 5 percent for the contractors insurance, B&O taxes, and bonding costs.

Additional Requirements

The contractor's records concerning the force account work are to be retained for a period of not less than three years. This is to allow the state access in case an audit becomes necessary. All records of subcontractor costs, applicable to the work, are also subject to this requirement.

Washington State Department of Transportation is generous in the fact that mark-ups are applied to labor, material, equipment, subcontract, and mobilization costs. The majority of specifications reviewed provide mark-ups on one or more of these items, but rarely are all four used. Several specifications allow avenues for material cost savings to be passed on to the owner that are available to the contractor. This could adversely effect the contractor if the discounts are not taken. The amount of paper work and the additional administrative costs can become substantial with force account work. Not only are additional copies of invoices required, but the contractor needs to retain the associated cost records for a minimum of three years. This also applies to each subcontractor's cost records.

Texas State Department of Highways and Public Transportation

The Texas State Department of Highways and Public Transportation, (TSDHPT) Standard Specifications for Construction of Highways, Streets, and Bridges is similar to the Illinois DOT documents but does not provide as much guidance. This specification is included to show the differences among the SHAs. The State of Texas does not allow a mark-up on the contractors equipment costs and the percentages applied differ from the two previous specifications. Contractors in road or bridge construction generally treat the cost of equipment as a direct cost. By not allowing a mark-up on this cost can represent a substantial loss to the contractor. Labor travel allowance and subsistence and mobilization

costs are not addressed by the specifications, neither are mark-ups on subcontracted work. The following is the applicable section of the Texas Department of Highways and Public Transportation specifications:

9.4 Force Account. When extra work is ordered to be performed on the "Force Account" basis, payment for same will be made as follows:

For all labor and foremen the Contractor will receive the rate of wage, to be agreed upon in writing before the beginning of such work, for each hour that said labor and foremen are actually engaged in such work, to which shall be added an amount equal to 25 percent of the sum thereof as compensation. No charge will be made by the Contractor for organization or overhead expenses, except for actual cost of premiums on public liability and workers compensation insurance, Social Security, unemployment insurance taxes, and Contractor's bonds. No charge for superintendence will be made unless considered necessary and ordered by the Engineer.

The Contractor will receive the actual cost, including freight charges, of the materials used on such work to which cost will be added a sum equal to 25 percent thereof as compensation. In case material invoices indicate a discount may be taken, the actual cost will be the invoice price minus the discount.

For machinery, trucks, power tools, or other similar equipment which may be considered necessary or desirable to use, the Engineer will allow the Contractor a reasonable rental price, as agreed upon in writing before such work is begun, for each hour that said tools or equipment are in use on the work, which price will include the cost of fuel, lubricants, and repairs without any additional compensation percentage being added.

The compensation, as herein provided for, shall be received by the Contractor as payment in full for extra work done on the "Force Account" basis and will include use of small tools, overhead expense, and profit. The Contractor's representative and the Inspector shall compare records of extra work done on the "Force Account" basis at the end of each day. Copies of these records will be made upon suitable forms provided for this purpose by the Department and signed by both the Department's and the Contractor's representatives, one copy being forwarded to the Engineer and one to the Contractor. All claims for "Extra Work" performed on the "Force Account" basis shall be submitted to the Engineer by the Contractor upon certified statements to which shall be attached certified copies of invoices covering the cost of, and the freight charges on, all materials used in such work, and such statements shall be filed not later than the tenth day of the month following that in which the work was actually performed.

Labor

The Texas State Department of Highways and Public Transportation compensates the contractor for direct labor costs up to and including the foreman level. The owner will not compensate the contractor for superintendent costs unless those costs were ordered by the Engineer.

A mark-up of 25 percent is applied to the labor costs as "compensation." Compensation includes "cost for the use of small tools, overhead expense, and profit."

Material

The contractor is reimbursed for the actual cost of materials used on the force account work, this cost includes freight charges. The owner will deduct the cost of any savings offered by a vendor to the contractor.

A mark-up of 25 percent is applied to the cost of materials for the work.

Equipment

The specifications treat owned and rented equipment equally, applying a rental rate cost toward the approved item. Equipment requirements and rates are to be agreed upon before the work begins.

No mark-up is applied to the cost of equipment.

Additional Requirements

The Texas specifications require that the owner and contractor compare records for the work performed at the end of each day. Depending on the size of the job this comparison can become quite lengthy, requiring additional work on the part of the job superintendent. The request for reimbursement from the contractor is to be received by the owner by the tenth day of the month following the month in which the work is performed.

The mark-ups for the Texas specifications are greater than those of the WSDOT contracts, but do not apply to equipment costs. On an engineering project where equipment would be a large part of the direct cost of the work, this could result in a substantial loss of money. Texas also applies a rental rate towards the cost of equipment, regardless of the ownership status. The Texas specifications provide dates for submitting documentation and require that the contractor and Engineer meet daily to verify costs.

The different percentages used as acceptable mark-up amounts for the various SHA's are summarized in Appendix C.

The municipality and utility provisions were included to provide a perspective from owners with different types of construction projects and differing regulatory constraints on contracting. Generally, these contract provisions provided a mark-up for the direct labor, material and equipment costs, similar to that of the state DOTs. The provisions are not presented in any particular order, they are included to highlight the contract clauses that were found in the municipality and utility contracts reviewed. They are provided to present the variety of clauses included in the cost plus provisions of various smaller owners. For example, the City of Detroit sets a maximum limit on the cost of the additional work based upon the City's estimate, Snohomish County allows supervision costs as a direct cost and Kansas City Power & Light Company provides a 5 percent penalty for cost documentation not submitted on time. As with the state agencies, the allowable direct costs and percentages used to compensate for overhead and profit were generally different for each specification reviewed.

Georgia Power Company

The Georgia Power Company provisions do not refer to force account work or cost plus, but allow cost adjustments on a cost reimbursable basis. No allowance is provided for overhead and profit. The Georgia Power Company will issue an "Extra Work Order" to the contractor for costs associated with additional work. If the parties cannot agree upon the cost, the Engineer will issue an extra work order based on the following provisions:

9.4.3 Adjustment of Contract Price

(a) The Contractor shall, before commencing Work pursuant to an Addendum, submit to the Purchaser a proposal for adjusting the Contract Sum to accomplish the Changes as described by such Addendum. The proposal shall include the Contractor's estimate of time to be deleted from or added to the Progress Schedule, in any, and shall be broken down by trade and by labor and material. If the Contractor's proposal is accepted by the Purchaser, Purchaser shall issue an Extra Work Order describing such Changes and authorizing the Contractor to proceed therewith, and the Contract Sum, Contract time and Progress Schedule shall be adjusted accordingly.

(b) If the Contractor's proposal is not acceptable to the Purchaser, the Contractor shall, if so directed by an Extra Work Order, proceed with the Changes as described by the Extra Work Order, and Contract shall be adjusted as follows:

(i) for Changes resulting in a cost or credit to the Purchaser, the Contract Sum shall be increased or reduced, as the case may be, based on either: (A) unit prices stated in the Contract Documents or subsequently agreed upon; or (B) the net savings or net additions in cost determined pursuant to Paragraph 9.4.3(c) below; and

(ii) for Changes which affect the time of performance by the Contractor of the Work, such reasonable additional time or lesser time as may be required shall be determined by the Purchaser after consultation with the Contractor.

(c) In determining the net savings in cost or the net additions in cost allocable to Changes authorized by an Addendum and corresponding Extra Work Order, only the actual savings in cost or additions in cost to the Contractor of the following items and no others shall be considered:

(i) payroll wages paid for labor employed at the job site, including costs of contributions, assessments or taxes based on such wages;

(ii) actual costs of materials, equipment and supplies which become an integral part of the Work and costs of materials and supplies which do not become a part of the Work but which are consumed in accomplishing the Work, including applicable sales taxes and costs of transportation but excluding costs of small tools (tools valued at less than \$200.00);

(iii) the actual rental costs of equipment used on the job at prevailing rental rates;

(iv) the cost of premiums for bonds and insurance which Contractor is required by the Contract Documents to purchase and maintain;

(v) payments made by the Contractor to subcontractors;

(vi) sales, use or similar taxes related to the Work and for which the Contractor is liable;

(vii) cost of removal of all debris; and

(viii) other costs incurred in the performance of the Work if and to the extent approved in advance in writing by the Purchaser.

(d) In the determination of costs enumerated in Paragraph 9.4.3(c) above, any additional costs incurred by the Contractor shall be supported and evidenced by appropriate invoices, vouchers, certified statements or other documents satisfactory to the Purchaser. Any savings in costs for these enumerated items

shall be determined by the Purchaser which shall, in making its determination, give consideration to the reasonable estimates of such savings made by the Contractor.

(e) Whenever it is determined that any Changes will require an increase in the Contract Time, the Purchaser may, at its sole discretion and to the extent possible, elect to offset all or parts of such increase with other Changes that will maintain the Contract Time. Whenever it is determined that any Changes will require an increase in the Contract Sum, the Purchaser may, at its discretion, elect to offset all or part of such increase with other Changes that result in a decrease in the contract Sum.

(f) Contractor hereby agrees that he will not make or seek to make any claim for additional compensation against the Purchaser for any work performed by the Contractor or subcontractors which was not directed and authorized in advance of commencement of performance of such work by a formal Addendum and corresponding Extra Work Order.

Labor

The Georgia Power Company reimburses the contractor for all labor employed at the job site. Payroll contributions and any assessments or taxes are also reimbursable.

No mark-ups are applied for overhead and profit.

Material

The actual cost of materials, equipment and supplies, including sales tax and the cost of transportation, are reimbursable. Small tools valued at less than \$200 are not covered.

No mark-ups are applied for overhead and profit.

Equipment

The contractor can recover the actual rental costs of equipment used on the job at prevailing rental rates. Ownership costs are not specifically addressed.

No mark-ups are applied for overhead and profit.

Subcontractors

The contractor will be reimbursed for any payments made to a subcontractor.

No mark-ups are applied for overhead and profit.

The Georgia Power Company reimburses the contractor for the direct costs associated with the additional work only, it does not address the issue of overhead and profit for the work. This is much different from the three previous examples which provide stipulated percentages for overhead and profit. In this case, the owner specifies what charges are reimbursable and then includes para. 9.4.3.c.(viii), which states the contractor can recover "other costs incurred in the performance of the Work if... approved in advance in writing by the Purchaser." By not addressing the overhead costs directly, this contract provision introduces ambiguity into the contracting relationship between the owner and the contractor.

Snohomish County, Public Utility District No. 1

The Snohomish County Public Utility District No. 1 also provides for cost plus contracting when both parties cannot agree upon a cost of performing additional work. The major difference here is that the cost of supervision is included as a direct cost, not considered an overhead cost. The specific clauses addressing cost plus reimbursement are very brief, and present limited guidance.

13.0 Changes in the Work

The DISTRICT, without invalidating the Contract, may order extra work or make changes by altering, adding to, or deducting from the work, the Contract sum being adjusted accordingly. All such work shall be executed under the conditions of the original Contract, except that any claim for extension of time caused thereby shall be adjusted appropriately.

Except in an emergency endangering life or property, no extra work or change shall be made unless pursuant to a written order by the DISTRICT, and no claim for an addition to the Contract sum shall be valid unless so ordered.

The value of any such extra work or change shall be determined in one or more of the following ways:

- a. By estimate and agreement on a lump sum.
- b. By unit prices named in the Contract or subsequently agreed upon.
- c. If, for any reason, method a. or b. cannot be agreed upon, such work will be paid for at the actual, direct cost of labor, payroll, taxes, material, equipment rental and field supervision required, with the addition of fifteen (15%) percent to cover profit, overhead, use of small tools, taxes, insurance, bookkeeping and all other incidental costs. In such cases, the CONTRACTOR shall keep and present in such form as the DISTRICT may direct, a correct accounting of such costs, together with supporting time cards and vouchers. Pending final determination of value, payments on account of changes shall be made on the DISTRICT'S estimate.

Labor

Snohomish county reimburses the contractor for the actual direct cost of labor, including the cost of supervision.

A mark-up of 15 percent is applied to "cover profit, overhead, use of small tools, taxes, insurance, bookkeeping and all other incidental costs."

Material

The contractor will be reimbursed for the direct costs of material.

A mark-up of 15 percent is applied to "cover profit, overhead, use of small tools, taxes, insurance, bookkeeping and all other incidental costs."

Equipment

The contractor will be reimbursed for the direct costs of equipment rental.

A mark-up of 15 percent is applied to "cover profit, overhead, use of small tools, taxes, insurance, bookkeeping and all other incidental costs."

This clause is unique in that the owner does not consider the cost of field supervision as an overhead cost, supervision is a direct cost. This provision makes an attempt to identify those costs included in the 15 percent mark-up, but includes the term "overhead" as part of the description, along with other costs that would be considered overhead. The clause is ambiguous in that the owner will pay the direct cost of taxes and also includes "taxes" as part of the 15 percent mark-up. The briefness with which cost reimbursement is specified introduces a great deal of confusion on the part of a contractor not familiar with this particular owner.

The provision does not specify when the contractors documentation of the change(s) needs to be provided to the owner. It does give the contractor an incentive to provide the records in a timely manner by making interim payments for the changes based on the District's estimate. If the District's estimate is lower than the costs the contractor is experiencing, it will benefit the contractor to submit any costs as soon as possible to the owner.

City of Detroit

The city of Detroit uses a variation on the cost plus concept. The city uses cost plus-limited amount. A cost limitation is set or fixed based upon a cost estimate developed by the "City Officer", the owners representative. The contractor is directed to perform the work and keep all the necessary records to support the costs, but if the City Officer's estimate is less than the actual costs, the City's estimate is used for the final cost of the change.

20. Methods for Determining Adjustments in Contract Price

Adjustments, if any, in the Contract price, either additive or subtractive, by reason of a change or modification in the Contract ordered in writing by the City Officer, shall be limited to the amount stated in the written order. Adjustment in price shall be determined by one or more of the following methods, the City Engineer having the right to select the method or methods used.

A. **Lump Sum Amount:** by this method, the amount of the adjustment will be the amount of an acceptable lump sum proposal from the Contractor. To facilitate checking and acceptance, the Engineer shall have the right to require the Contractor's lump sum proposal to be itemized with quantities and prices for the various items.

B. **Unit Prices:** By this method, the amount of the adjustment will be computed by applying acceptable unit prices to the various items. The unit prices may be those for which there are applicable unit prices in the original Proposal, the approved Detailed Estimate, or may be those fixed by subsequent agreement between the City and Contractor.

C. **Cost-Plus-Limited Amount:** By this method, the amount of adjustment will be determined by (a) the actual, necessary, and reasonable costs directly incurred by the Contractor or subcontractor, plus (b) a fixed percent, and (c) with the total amount limited to the maximum amount stated in the City Officer's written order.

The total amount of the adjustment will be determined as follows:

"Actual Cost" will consist of:

- 1) **Labor:** Being the amount shown on the Contractor's payroll for direct labor used, with payroll taxes or contributions for Unemployment Insurance Compensation and Federal Social Security, etc., added, when same have been incurred. In no case, however, shall the wage rates charged for labor exceed the wage rates paid for the same class of labor employed on the original contract work; plus
- 2) **Materials:** Being the net cost of materials, including the cost of transportation to the site, as shown by invoices; plus
- 3) **Equipment:** Being the actual cost of equipment rental, or rental value if contractor-owned, but not to exceed the prevailing rentals charged in the Detroit district for equipment of like size and condition, plus the actual incurred costs for necessary supplies and repairs for operating the equipment; plus
- 4) **Insurance:** Being the net additional cost of insurance premiums which are incurred and which are determined from the labor payrolls, limited, however, to such types of insurance required by the Contract.

To the total sum of Items 1 through 4 shall be added the following percent:

5) For Work Done by Contractor's Forces: Fifteen percent as compensation for all other items of expense, including superintendence, use of ordinary tools, general overhead, bonds, and profit.

6) For Work Done by Subcontractor's Forces: Ten percent of the subcontractor's "actual costs", computed in accordance with Items 1 through 4, as full compensation for all other items of expense and profit of the subcontractor, plus an additional five percent of the subcontractor's "actual costs" as full compensation for all the other items of expense and profit of the Contractor.

7) When Both Extra and Omitted Work: When the City Officer's written order involves both extra work and omitted Contract work in a lump sum contract, or a part of a lump sum item in a unit price contract, the difference between the actual cost of the extra work, obtained pursuant to Items 1 through 5, and estimated net cost, exclusive of overhead and profit, of the omitted Contract work shall be taken at 87 percent of the total cost shown in the Detailed Estimate or lump sum amount for the item in the Proposal, or, if such is not applicable, by estimate according to Items 1 through 4.

The total adjustment in the Contract price shall then be determined as follows:

a) Net Increase: If the actual costs of the extra work exceeds the estimated net cost of the omitted Contract work, the Contract price shall be increased by the net difference, plus the applicable percent in Items 5 or 6.

b) Net Decrease: If the estimated net cost of the omitted work exceeds the actual cost of the extra work, the Contract price shall be reduced by the net difference, plus five percent of the estimated net cost of the omitted work. When the City's written order involves both extra work and omitted work covered by Contract unit prices, the cost of the extra work shall be determined in accordance with Items 1 through 6 and the cost of the omitted work shall be obtained by Contract unit prices. The adjustment in the Contract price shall be the difference, either additive or subtractive, between the cost of the extra work and the omitted work.

8) Maximum Limit of Cost: The total amount of the adjustment in the Contract price shall be limited to the maximum amount stated in the City Officer's written order to the Contractor to perform the work. The final amounts that are to be allowed will be as computed pursuant to Items 1 through 7 or the stated maximum amount, whichever is the lesser amount.

- 9) **Records of Costs:** The Contractor and his subcontractors shall keep accurate, complete, daily records of the net actual cost incurred for the extra work performed, and shall present such information in the form and times as directed by the Engineer, as provided for in Article 22 herein.

Labor

The contractor will be reimbursed for the amount shown on the Contractors payroll for the direct labor used, including payroll taxes and contributions.

A mark-up of 15 percent is applied "as compensation for all other items of expense, including superintendence, use of ordinary tools, bonds, and profit."

Material

The owner will reimburse the net cost of materials, including the cost of transportation.

A mark-up of 15 percent is applied "as compensation for all other items of expense, including superintendence, use of ordinary tools, bonds, and profit."

Equipment

The contractor can recover the actual cost of equipment rental or rental value regardless of ownership status, plus the actual incurred costs for necessary supplies and repairs for operation of the equipment.

A mark-up of 15 percent is applied "as compensation for all other items of expense, including superintendence, use of ordinary tools, bonds, and profit."

Subcontracted work

The subcontractor can recover the actual costs of work performed plus a 10 percent mark-up as "full compensation for all other items of expense and profit of the subcontractor".

The contractor is allowed a 5 percent mark-up on the "actual costs" of subcontracted work.

This clause provides a different mark-up percentage for the subcontractor's and contractor's costs. Other contracts reviewed applied the percentage mark-up equally to both the subcontractor's and contractor's direct cost. In this case, subcontractors receive a ten percent mark-up while the general contractors receive 15 percent. The general contractors receive an additional 5 percent mark-up on the subcontractors' actual costs as "full compensation for all the other items of expense and profit " The final cost of the

change is based upon the City Engineer's cost estimate. This encourages the contractor to perform the work in the most economical manner available.

Kansas City Power & Light Company (KCPL)

The KCPL provisions describe a 5 percent penalty that is imposed when the contractor fails to submit cost documentation prior to the specified time limit. The applicable sections of the KCPL specifications are provided below:

If no price is agreed to, payments for extra work will be based on the following:

A. Total direct labor costs including straight time labor, payroll taxes and insurance and fringe benefits incurred by Contractor plus 5% for overhead, plus 5% for margin. Premium portion of overtime hours worked shall be invoiced separately with no markup for insurance, overhead or profit.

The Contractor shall provide a listing by craft of the direct labor charges excluding percentage markups for overhead and margin with this proposal.

B. Contractor's owned equipment (originally costing \$500.00 or more), shall be provided at rates not to exceed the rates shown for such equipment in the latest edition of the Associated Equipment Distributor's (A.E.D.) Handbook. In the event Contractor owned equipment already on site is utilized, the rates invoiced shall be prorated on a monthly rental basis in accordance with A.E.D. practice. In the event Contractor owned equipment is not available, Contractor shall be reimbursed for actual cost of equipment rental only without additional markup.

C. Material or subcontracted work shall be invoiced at Contractor's direct cost plus 5% for overhead and profit.

D. Markup percentages stated in this section are inclusive of, but not limited to, all field and home office overhead expenses, engineering, salaried supervision, support facilities, small tools, drafting and engineering, etc.

The Contractor shall submit a properly filled out and completed KCPL Contractor Charge Ticket - (Charge Ticket) for each individual job and for each day that the job is worked on by the Contractor.

The Charge Ticket(s) for one days work will be submitted to a designated Company employee for approval no later than 11:00 a.m. on the work day following the day the work was performed. It is expressly agreed that failure of the Contractor to comply with the Company requirements of timely and complete Charge Tickets may result, at the Company's option, in an administrative

assessment of 5% of the gross figures submitted on late or erroneous Charge Tickets. The 5% assessment will be deducted from the total charges on the Charge Ticket.

Labor

Kansas Power & Light Company will reimburse the contractor for direct labor including taxes, insurance, and benefits.

A 10 percent mark-up is applied to the straight time labor cost for overhead and margin. No mark-up is applied to the premium portion of overtime hours worked.

Material

The contractor will be reimbursed for the direct costs of materials.

A mark-up of 5 percent is applied for overhead and profit.

Equipment

The contractor can recover equipment costs for owned equipment that does not exceed the rates shown in the latest edition on the Associated Equipment Distributor's (A.E.D.) Handbook. Equipment already on site will be paid for based on a monthly rental basis in accordance with A.E.D. handbook.

No mark-up is applied for equipment costs.

Subcontractor

A mark-up of 5 percent is applied to the contractor's direct costs for overhead and profit.

Kansas Power & Light Company requires the contractor to submit records of the costs of the change(s) to the owner by "no later than 11:00 a.m. on the work day following the day the work was performed." If the records are not provided on time, the owner has the option of assessing a 5 percent deduction to the costs of the previous days work. This creates a tremendous amount of pressure on the superintendent to have records to the owner by the following day.

Other items of interest are the fact that the owner will not pay the overhead and profit mark-up on the premium portion of overtime work. The owner is willing to pay overhead and profit for an additional employee brought onto the job, but not for the premium portion of a worker already on the site.

Long Island Lighting Company (LILCO)

The Long Island Lighting Company also treats the premium portion of overtime work differently than the straight time rate. LILCO will pay a percentage mark-up on the premium portion of overtime work, but at a reduced rate. The standard mark-up is reduced over 40 percent, from a mark-up of 35 percent for straight time, to only 20 percent for the overtime premium.

Payment

Additional or Extra Work Performed by the Contractor

Payments for additional or extra work authorized by the Long Island Lighting Company may be made on a time unit basis as set forth below:

Labor Rate Schedule

Straight Time

The billing rate will be in accordance with the respective contractual hourly labor wage rate including the contractual benefits then in effect for the classifications involved, up to and including trade foreman, plus thirty-five percent (35%).

Equipment Rate Schedule

Equipment furnished will be charged at the "going" rental rate for the piece of equipment including fuel, maintenance, overhead, profit and all operating costs exclusive of labor.

Material Rate Schedule

Materials furnished will be charged at the "going" market prices, as invoiced to the contractor, and multiplied by a factor of 1.10.

Overtime

When overtime is specifically authorized by the Long Island Lighting Company, the Contractor will be reimbursed for the premium portion of the overtime as follows:

The premium billing rate will be in accordance with the respective contractual hourly labor wage rate including the contractual benefits then in effect for the classifications involved up to and including trade foreman, plus twenty percent (20%).

The above factor includes statutory costs, and all overheads that will be applied to the contractual hourly wage rate, and benefits.

Work Performed by Subcontractor

Subcontractor's charges to the Contractor for labor, material and equipment will be as defined above. Contractor markup shall be the subcontractors' charge plus ten percent (10%).

No handling charge or percentage markup will be permitted on the premium portion of overtime.

No handling charge or percentage markup will be permitted a subcontractor for additional work performed by subordinate subcontractors.

Labor

The Long Island Lighting Company will reimburse the contractor for labor at the rate applicable in the contract up to the foreman level. Premium wage rates for overtime are also established by contract and are applicable for any changed work.

A mark-up of 35 percent is applied to the costs of straight time labor. A mark-up of 20 percent is applied towards the costs of overtime premium work.

Material

The materials paid for will be at the "going" market rate.

A factor of 1.10 (10 percent mark-up) is applied to the cost of materials.

Equipment

Equipment will be charged at the "going" rental rate which will include "costs for fuel, maintenance, overhead, and profit and all operating costs exclusive of labor." No distinction is made between owned or rented equipment.

No additional mark-up is allowed.

Subcontractor

The general contractor is allowed a mark-up of 10 percent on the subcontractor's charges.

No mark-ups are allowed on the premium portion of overtime for subcontracted work.

No mark-ups are allowed to a subcontractor on sub-subcontracted work.

Both the contractor and subcontractor can apply the 35 percent mark-up on the labor portion of the work, unlike the City of Detroit contract provisions, which apply different mark-ups to the general contractor and subcontractor. The Long Island Lighting Company will pay a mark-up on the premium portion of overtime, but only the contractor performing the work can receive a mark-up on that portion of work. The general contractor will not be given a mark-up on the premium portion of overtime work done by a subcontractor. The Long Island Lighting Company does not allow a mark-up to the subcontractor for any work performed by a sub-subcontractor.

Federal Agencies

The Federal Acquisition Regulations are included to provide input from an agency which contracts on the national level. Federal agencies have cost plus contracting options available, but the overhead and profit is not based on the direct costs of the changes.

Federal construction contracting agencies, mainly the Army Corp. of Engineers and the Navy's Civil Engineer Corp. are subject to the regulations set forth in the Federal Acquisition Regulations (FAR). The FAR provides federally-mandated purchasing directives to all the federal agencies authorized to purchase products or construction services for the normal operation of their work.

The type of cost plus contracting discussed in the previous contract specifications is based upon the contractor receiving a percentage mark-up for overhead and profit based on the direct costs of the work. The FAR refers to this type of contracting as cost-plus-a-percentage-of-cost. Federal Acquisition Regulations, Part 16, Section 16.102 prohibits the federal agencies from contracting with this method.

Types of Contracts

16.102 Policies

(a) Contracts resulting from sealed bidding shall be firm-fixed-price contracts or fixed-price contracts with economic price adjustment.

(b) Contracts negotiated under Part 15 may be of any type or combination of types that will promote the Government's interest, except as restricted in this part (see 10 U.S.C. 2306(a) and 41 U.S.C. 254(a)). Contract types not described in this regulation shall not be used, except as a deviation under Subpart 1.4.

(c) The cost-plus-a-percentage-of-cost system of contracting shall not be used (see 10 U.S.C. 2306(a) and 41 U.S.C. 254(b)). Prime contracts (including

letter contracts) other than firm-fixed-price contracts shall, by an appropriate clause, prohibit cost-plus-a-percentage-of-cost subcontracts (see clauses prescribed in Subpart 44.2 for cost-reimbursement contracts and Subparts 16.2 and 16.4 for fixed-price contracts).

(d) No contract may be awarded before the execution of any determination and findings (D&F's) required by this part. Minimum requirements for the content of D&F's required by this part are specified in 1.704.

Federal agencies are prohibited from using the cost-plus-a-percentage-of-cost contracting method, whether on construction contracts or on contract modifications. It is the policy of the Federal Government to have a price established in advance on any modification to a construction contract. The following section of the Federal Acquisition Regulations provides guidance in this area.

FAR Part 43, Contract Modifications

43.102 Policy

(a) Only contracting officers acting within the scope of their authority are empowered to execute contract modifications on behalf on the Government. Other Government personnel shall not---

- (1) Execute contract modifications;
- (2) Act in such a manner as to cause the contractor to believe that they have authority to bind the Government; or
- (3) Direct or encourage the contractor to perform work that should be the subject of a contract modification.

(b) Contract modifications, including changes that could be issued unilaterally, shall be priced before their execution if this can be done without adversely affecting the interest of the Government. If a significant cost increase could result from a contract modification and time does not permit negotiation of a price, at least a maximum price shall be negotiated unless impractical.

Unlike force account or cost plus work where the final price is not determined prior to commencing the work, the federal government's policy is, at the very least, to determine a maximum price for any changes directed by the owner. Pre-pricing of modifications prevents the government from obligating itself for more costs than the amount of funds available for the contract. For changes that are performed prior to negotiating a final price

the government is obligated to take into consideration the reduced risk on the part of the contractor when determining the final price. The federal government's policy is to compensate the contractor for overhead expenses and determine a rate of profit based upon the risk assumed by the contractor. Cost-plus-a-percentage-of-cost contracts essentially reduces the contractor risk to zero. The FAR does authorize other forms of cost reimbursable contracting, but these are rarely used in construction contracts. These other forms are used extensively in the environmental clean-up areas of contracting.

The table on the following page summarizes the allowable costs, the percentage mark-up allowed, and any special restrictions noted during the review of the quoted provisions.

TABLE 1. PROVISIONS SUMMARY

Agency	Mark-up Applied				Special Considerations
	Labor	Material	Equipment	Sub-Cont.	
Illinois Department of Transportation	35%	15%	0%	5%<10K 1%>10K	10% Mark-up on Bond, Insurance and Tax Subcontracted costs are not addressed
Washington State Department of Transportation	20%	15%	15%	5%	Owner does not pay for off-site mobilization preparatory costs below \$300. Contractors and subcontractors cost documentation to be retained for a minimum of three years
Texas State Department of Highways and Public Transportation	25%	25%	0%	0%	Owner and contractor required to compare additional costs daily. Claim for reimbursement is due to owner by the tenth day of the month following the month the work was performed.
Georgia Power Company	N.A.	N.A.	N.A.	N.A.	Does not specifically address overhead and profit. Owner does not pay for small tools under \$200.
Snohomish County, Public Utility District No. 1	15%	15%	15%	0%	Interim payments for additional work is based on the owners estimate.
City of Detroit	15%	15%	15%	5%	Subcontractors receive 10% mark-up on direct costs for overhead and profit.
Kansas City Power & Light Company	10%	5%	0%	5%	Owner allows 5% penalty for contractors not providing cost documentation by 11:00 am following the day work is completed. Does not pay mark-ups on premium portion of overtime work.
Long Island Lighting Company	35%	10%	0%	10%	Premium portion of overtime work receives 20% mark-up. Subcontractors receive no mark-up on sub subcontracted work.
Federal Agencies	0%	0%	0%	0%	Cost-plus-a-percentage-of-cost not authorized by FAR.

Interviews

Interviews were held with Seattle professionals working in the construction industry. Those interviewed are working as claims consultants, certified public accountants and lawyers, all with close ties to the construction industry. Interviews centered around experiences and problems encountered with cost plus contracting. The recurring issues are discussed in this paper.

What does "overhead" include?

Defining overhead was the number one problem mentioned by the consultants. The majority of contracts state that the percentage mark-up covers "overhead expense and profit." By not defining what the owner considers "overhead", the owner has introduced ambiguity into the contract. Overhead costs are generally excepted to be, the costs of a job which cannot be assigned to any particular item of work. Overhead costs include the salary of a job superintendent, job trailer costs, and utility costs. These items are well accepted as overhead costs, and for smaller jobs it may be fairly easy to agree upon overhead costs. Unfortunately, this does not always provide a fair assessment. In the construction industry, each job is different from the previous one requiring different costs to perform the work. Larger jobs which have many layers of supervision and a very extensive administrative support system include more items of overhead. Different jobs incur different amounts and types of overhead costs. It is this constantly changing method of performing the work which makes identifying overhead costs ahead of time so difficult. Examples of job-site overhead which cause problems on construction projects are listed below:

- tower cranes
- forklifts
- testing and inspection services
- mobilization/demobilization
- small tools
- worker transportation

Tower Cranes

A tower crane is on the job-site throughout most of the construction project, being used to deliver material and equipment to the various subcontractors working on the job. How the cost of the crane is charged against the project is determined by the contractor's accounting system. At the University of Washington there are presently three tower

cranes erected and being used on the construction sites. The costs for the cranes are accounted for in two different ways. One contractor carries the cost as an overhead item while the other treats it as a direct cost. The method used directly effects the amount of reimbursement the contractor receives for overhead and profit on changes. If the contractor carries the crane as a direct cost, the overhead reimbursement is increased. Conversely, the other contractor regards the tower crane as not being considered an overhead expense. If the crane is charged as an overhead item the contractor must recover the costs from the overhead mark-up. The contractors at the University have billed for the crane costs differently depending on the nature of the changes. For changes that required a great deal of crane time the cost has been treated as a direct cost, with the percentage mark-up for overhead and profit being applied to this cost. When changes require little crane time, the costs were absorbed by the overhead and profit mark-up. How the costs will be charged is part of the negotiation process for the cost of the changes and depends on the nature of the change and past practices.

Forklifts

The general contractor often provides a forklift at the job-site which is used to unload trucks and deliver materials on the site. This is often treated as a service being offered to subcontractors. In terms of costing, this situation is very similar to that of the tower cranes. The cost can either be treated as a direct cost to the subcontractors or included in the general contractors job-site overhead. If the forklift is carried as an overhead cost, the contractor receives reimbursement from the standard percentage mark-up.

Testing and Inspection Services

Additional testing and inspection services may be required as a result of a change. How the contractor charges for this service effects the amount of money received for overhead and profit. If this cost is billed as a direct cost the mark-up is applied to a larger cost, increasing the funds paid to the contractor.

Mobilization/Demobilization

If a change requires a contractor to mobilize additional resources or demobilize crews, these costs need to be considered part of the change. If the costs are considered overhead or direct costs needs to be determined by both the contractor and owner early in the contract. Of the specifications reviewed, only the Washington State DOT specifications address this cost. WSDOT considers the costs to be a direct cost and will pay a 15 percent mark-up to cover overhead and profit. Any costs under \$300 incurred off-site in

preparation for mobilization will not be paid for by the state and is considered an overhead expense. Other agencies do not specify if they consider the costs direct or part of the contractors overhead.

Small Tools

Small tools may be either broken, lost, or stolen during the course of a project and such tools need to be replaced. Who pays for this costs presents an item of negotiation between the contractor and owner. WSDOT and the Texas State Department of Highways and Public Transportation do not allow direct billing for the cost of small tools, this cost is considered part of the percentage mark-up received on the direct costs of the work. This practice is representative of the majority of the contracts reviewed.

Worker Transportation

In a situation where the contractors access to the work site is restricted, transportation is needed to shuttle workers to and from the site. If changes arise during the job, the cost of transporting the workers and when they actually clock-in becomes an item for negotiation.

Other items which represent a real cost to the contractor and need to be addressed early include: layout and engineering costs associated with changes, change preparation costs, and temporary equipment costs. The contractor and owner need to agree upon what costs are covered by the percentage mark-ups and what costs will be paid for directly. Both parties will benefit from agreeing upon costs early in the contract before changes occur.

Cost Control

Consultants who generally represented owners, expressed concerns over the lack of cost control in cost plus contracting. Cost plus contracting, as detailed in the contracts examined in this study, provides the contractor a percentage of the direct costs as reimbursement for overhead and profit. The federal government refers to this type of cost plus contracting as, cost-plus-a-percentage-of-cost contracting. The contractor's mark-up is applied against the direct costs associated with the changed or additional work, i.e., the payment received by the contractor for overhead and profit is based upon the direct costs of the work performed. With this method of contracting, the contractor actually receives more money for overhead and profit if the costs increase. There is no mechanism within cost-plus-a-percentage-of-cost contracting which encourages, requires or forces the contractor to control costs.

An example of a strategy used by some contractors to increase direct costs is to assign the less efficient workers to the additional work. This practice not only increases the contractors costs associated with that work, which in turn increases the amount received for overhead and profit, but also allows the contractor's more efficient workers to continue with the original work at a reduced cost. The contractor's original bid allowed for both the efficient and inefficient workers being assigned to the original work, but when only the efficient workers are assigned to that particular task, the work can be performed at less cost to the contractor. Assigning inefficient workers to cost plus work provides increased reimbursement for overhead and profit and allows contractors to realize additional profits.

Several agencies have implemented specific measures in an attempt to control the costs of changes to be performed by cost plus contracting.

Of the contract documents examined, the City of Detroit has the most stringent restrictions on costs. Detroit uses a cost plus-limited amount concept. The city establishes a maximum amount to be paid for changes and does not pay for costs which exceed the amount stated in the change. This method does not necessarily encourage the contractor to reduce costs but does encourage the contractor to "not exceed" a pre-established amount.

Another often used method to control costs is for the contractor's and owner's representatives to review the direct costs associated with a change at the end of each work day. The state of Texas requires that both parties agree upon the work performed at the end of the day and submit signed records to the department. Labor rates are equivalent to those used in the original contract, and material and equipment costs, are supported by invoices. Agreeing upon work performed essentially determines the costs of the work. This allows both parties to agree upon the amount of work performed, material installed, and equipment used, while the work is fresh in everyone's mind. The Kansas City Power & Light Company (KCPL) provides a penalty for the contractor who does not submit cost information within the required time. KCPL requires the contractor to submit documentation of costs by 11:00 am of the day following the day the work was performed. If records are not submitted on time, a 5 percent penalty can be assessed against the gross charges for that day's work. The 5 percent penalty is equivalent to the mark-up provided for the contractors margin. These measures do little to prevent a

contractor from assigning inefficient workers to the cost plus work, but they do provide for a timely review of the costs incurred.

Yet another method used by owners to try and control costs is inserting wording such as "reasonable and allowable cost will be reimbursed." This allows the owner some review of methods used by the contractor to ensure only necessary costs are included as part of the compensation. Material costs can also be reviewed by the owner's representatives for reasonableness. Costs that are excessive and cannot be substantiated by the contractor are reimbursed at a reasonable cost established by the owner.

Impacts on Other Work

Cost plus contracting only reimburses the contractor for the costs associated with the change. However, the consultants pointed out that the impacts could be much more pervasive when forces are redirected to perform a cost plus change, the original schedule may be impacted, depending on the extent of the change. The contractor needs to determine the most economical method of performing the additional work. If the contractor elects to hire additional forces to perform the changed work, the original work should not be effected, unless the work cannot continue until the change is complete. If the work is being completed concurrent with the original work, with no additional forces, a slowdown in the original work would be expected. In cost plus contracting the contractor is not reimbursed for this slowdown in progress. With cost plus contracting, it would benefit the contractor to hire additional workers to perform the changed work. This may be easier said than done. The workers need to come from somewhere. If workers are taken from other projects, the progress of those projects may suffer without receiving any compensation. Another option would be for the contractor to hire additional workers and assign them exclusively to the additional work. This may not be economically advantageous on small changes. The contractor needs to determine the method which will complete the work with the least impact on the original contract work.

Overcompensation

Several consultants felt the standard percentage mark-ups overcompensate the contractor for most changes. For the majority of the changes encountered, the contractor does not hire additional field staff or supervisors, nor does the existing job superintendent receive additional pay for any increased work caused by the change. Home office overhead is not increased due to the additional work. The office staff does not receive a raise and additional personnel are not employed to support the increased workload. Generally, the

original work progress suffers somewhat and the contractor is compensated for the costs associated with the change, along with any required time extension. The contractor generally experiences very little, if any, additional overhead costs, but is reimbursed with a mark-up on the direct costs of the change. This mark-up is seen as going more towards profit than overhead. The extent of overcompensation depends on the type of changed work being performed. This can easily be seen when looking at a change that involves very little labor costs, but a large change in the cost of materials. For example, if the owner decides to upgrade a piece of electrical switchgear, the contractor will not experience any great increase in labor costs for installing the switch gear. However, the contractor will receive a mark-up on the additional costs of the material. The real overhead costs the contractor may only be a phone call to a supplier to order the new equipment. Depending on the changes directed, the cost plus method may overcompensate the contractor for overhead costs.

Delays

Several consultants pointed out the fact that cost plus reimbursement does not compensate contractors for delays on the project. Changes which cause delays, but do not involve large direct charges, do not reimburse the contractor for delay costs. For example, if a contractor is delayed while awaiting direction on the adequacy of a piece of switchgear and the result does not require additional direct costs, the percentage mark-up will not compensate for the delays.

Conclusions

Cost plus contracting does not provide equitable compensation for all types of changes. It should only be used to determine costs in those situations where the direct cost of the change is commensurate with the amount of administrative effort and risk associated with the change. For changes that involve a large increase in the cost of materials, with little additional labor or overhead required, the contractor will be overcompensated for the change. In this instance the contractors additional effort may only entail contacting the material supplier and changing the material order. Conversely, for changes that cause delays with little direct costs involved, the contractor will be under compensated for the change.

Compensation provided on a cost reimbursable basis, either force account or cost plus, varies greatly from owner to owner. All the contracts reviewed compensated the contractor for the direct costs of the work required to perform the extra work or changes directed by the owner. The owners guidance on what costs are allowable was somewhat different for each owner. Some owners considered small tools an allowable direct cost while others treated them as overhead. Similar situations existed for mobilization/demobilization and transportation costs. The greatest variance appeared in the percentage mark-up each owner applied and how that mark-up was applied to the direct costs. Large differences were observed between seemingly similar owners such as the SHAs. The difference that would have the greatest effect on contractors was applying or not applying a mark-up to the direct equipment costs. In the heavy construction industry, the contractors equipment costs are typically treated as a direct cost, and not applying a mark-up to this direct cost greatly effects the compensation paid for changes.

Recommendations

For the contractor; the contractor needs to be aware of the differences which are present in the contracts of various owners. As was shown in this study, just about every owner has a different method of compensating for work done on a cost reimbursable basis. Contractors need to make note of the differences present in contracts being bid on.

The contractor needs to know their cost of overhead as a percentage of the direct costs. If the percentage mark-ups included in a contract are not sufficient to compensate the contractor for overhead and profit, the contractor may chose not to compete for the contract. On the other hand, if the contractor is interested in a specific project, accounting procedures may need to be changed to allow for proper compensation based upon the contractually established mark-ups. For example, costs normally treated as overhead may need to be billed as direct costs for a contractor to obtain favorable compensation.

Contractors need to establish with the owner those costs which are included in the established mark-up. This should be done before any changes are proposed. Having a well defined "list" will ease the negotiation process. Overhead items will not have to be discussed unless additional items are identified after establishing the list. Developing a list of overhead items will be a negotiation in and of itself, the owner and contractor will not necessarily agree on each item beforehand.

Examine provisions of owners with similar objectives, such as State Highway Authorities, in an attempt to standardize the provisions. Examine specifications of owners of comparable size, in an attempt to standardize contract compensation.

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Appendix A

Interviewees

Mr. Stan Davis, Hainline & Associates, Seattle

Mr. John Farbarik, Private Consultant

Mr. Steve Goldblatt, Professor, University of Washington

Mr. Jerry Hainline, Hainline & Associates, Seattle

Mr. Jerry Jewell, Associated Construction Consultants Inc., Bellevue

Mr. Kerry Lawrence, Lawrence & Syria, Bellevue

Mr. Ronald Maus, Peterson Consulting, Seattle

Mr. Mike Summers, Private Consultant

Appendix B

JOB SITE OVERHEAD QUESTIONNAIRE

(Developed by Gary Leach)

(University of Washington, Graduate Research Project)

1. Please describe your experiences with controversial job-site overhead costs.
2. Are the problems described more often related to certain items of overhead verses overhead in general?
3. Are the problems described more prevalent in one type of construction or another?
4. Are the problems described more prevalent for one construction trade or another?
5. Are the problems described more prevalent with one type of owner or another?
6. Do these problems effect the general more than sub-contractors?
7. In your experience, do owners often rely on standard percentages to cover overhead costs or are they willing to establish job specific figures?
8. Have you encountered construction contracts that specify what is covered by the standard percentages for overhead, specifically job-site overhead?
9. What do you see as being the biggest problem with using standard percentages for changes or additional work?
10. What range of percentages have you experienced.
11. Are you aware of any studies which have been performed to substantiate percentages used in any contract?
12. Do you have an alternative method for determining the overhead costs?

Appendix C

STATE	LABOR	MATERIAL	EQUIPMENT	MOBILIZATION	SUBCONTRACTORS	MU SUBCONTRACTORS	INSURANCE / BONDING	SMALL TOOLS	COMMENTS
AL	20	15	0			3% < 20K 1% > 20K	0	OH	Doesn't address ownership costs Compare records daily
AK	30	15	15	0	15	10% < 1K \$100 + 5% 1-10K \$550 + 3% > 10K		OH	Only pay mobilization costs
AZ	15	15	10	15		10% < 10K 5% > 10K		OH	Mobilization markup only applies to use of common carrier
AR	20	15		0				OH	
CA	33	15	15		15			OH	Equipment markup only applies to rental costs
CO	67	15						OH	Labor markup covers bond, insurance, and taxes, fringe benefit costs are additional
CT	20	15	0			15	6	OH	Sub markup same as general contractor Compare records daily
DE	20	15	15			15	6	OH	Sub markup same as general contractor
FL	30	15	10			5% < 20K 1% < 20K	10	OH	Equipment markup for rented highway trucks only Compare records daily
GA	15	10	0				0	OH	Compare records daily
HI	20	20				5	6	OH	Sub markup same as general contractor
ID	20	15	15	15		\$100 < 1K \$100 + 5% 1-10K \$550 + 3% > 10K	6	OH	
IL	35	15				5% < 10K 1% > 10K	10	OH	

STATE	LABOR	MATERIAL	EQUIPMENT	MOBILIZATION	SUBCONTRACTORS	MU SUBCONTRACTORS	INSURANCE / BONDING	SMALL TOOLS	COMMENTS
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IN	20	12	12			10% < 3K 7% > 3K	10		
LA	15	15	0						Provisions very brief
KS	20	15	15			15% < 2K \$300 + 10% 2-5K \$600 + 5% > 5K			Insurance/bond rate established by Secretary(?)
KY	25	15	0	0	0	0	0	0	15% markup on equipment for fuel, lube, and filters Insurance/bonding costs reimbursed
LA	20	15	0			10	6	OH	Compare records daily
ME	90	15	0						Labor markup to cover insurance, bonds, taxes, employee benefits, overhead and profit
MD	15	10	5			5		OH	Sub markup same as general contractor
MA	10	10	10			10	10	OH	Reimburse cost of bonds
MI	20	20	10/20			3	20	OH	Equipment markup based on monthly rental and operating costs
MN	49	15	0	0		10% < 10K 2% > 10K			Add 39% to labor markup for steel work Add 15% to labor markup for concrete pile driving
MS	15	15	0	0			0	OH	Compare records daily
MO	20	15	0				10	OH	Compare records daily
MT	80	15	0			10% > 1K \$100 + 5% 1-10K \$550 + 3% > 10K	0	OH	Labor markup similar to Maine No markup allowed for sub-subcontractor work
NE	20	15	15					OH	Equipment markup 0% for owned equipment Subcontractor markups same as general contractor Compare records daily

STATE	LABOR	MATERIAL	EQUIPMENT	MOBILIZATION	SUBCONTRACTORS	MU SUBCONTRACTORS	INSURANCE / BONDING	SMALL TOOLS	COMMENTS
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NV	25	20	20					OH	Subcontractor markups same as general contractor Compare records daily
NH	45	15	0			5		OH	Retain records for three years
NJ	25	25							Only 10% markup on labor and material if no time extension involved Reimburse insurance/bonding costs
NM	25	15	0				6	OH	Will pay mobilization costs
NY	20	20							Markup no applicable to overtime premium Markup 25% if subcontractor is used
NC	35	15	15			10% < 10K \$1000 + 8% 10-25K \$2200 + 1% > 25K	6	OH	
ND	20	15	0			10% < 5K 3% > 5K	6	OH	Compare records daily
OH	30	15	15			5			Markup on subcontractor not to exceed \$5000 dollars
OK									None
OR	22	17	17			10% < 2K 5% > 2K			
PA	25	25	25			2	OH	OH	
RI	20	15				10	6	OH	Compare records daily
SC	30	15					OH	OH	Health and welfare benefits are part of labor markup
SD	15	15	0				25.1		Insurance/bonding markup applied to labor cost 10% markup on total cost for profit
TN	22	15						OH	Insurance/bonding will pay cost Compare records daily
TX	25	25	0					OH	Compare records daily

STATE	LABOR	MATERIAL	EQUIPMENT	MOBILIZATION	SUBCONTRACTORS	MU SUBCONTRACTORS	INSURANCE / BONDING	SMALL TOOLS	COMMENTS
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UT	30	15	0			5		OH	Subcontractor markup applies to labor and material costs only
VT	15	15	0				0	OH	Labor and material markup 20% for subcontracted work
VA	45	15	15			10	25	OH	Insurance/bonding markup applies to labor costs only Markup on subcontractors applies to cost before all markups
WA	20	15	15	15	5	5	5	OH	
WV	40	20				5% < 20K 1% > 20K	0	OH	
WI	35	15	0			5	15	OH	Compare records daily
WY	57	15	0					OH	Labor markup includes overhead, insurance, workmen's compensation, unemployment, and social security taxes Contractor reimbursed cost of health and welfare benefits and pension fund benefits No additional for subcontractors work "Subcontractor and general contractor agree upon division of costs"